Cure of Intracranial Aneurysm Without Use of Blood Transfusion

JACK POSNIKOFF, M.D., *Orange*

THERE ARE PEOPLE still present in our society who are willing to accept death rather than violate religious principles. To the surgeon this presents a most distressing professional and medico-legal frustration when blood transfusion is considered and the patient refuses because of religious tenets.

In the case of minors the law aids the surgeon in circumventing this restriction. An adult, however, is generally legally able to decline the use of blood in his own therapy.

Under circumstances of refusal by adults before elective operation, the surgeon may reject the case entirely or he may accept the restrictions, promising to adhere to them at operation regardless of the consequences. In the dire circumstances of mandatory blood transfusion and the latter alternative, the surgeon would be faced with distressing conflict between legal impediments and ethical responsibility.

In the case presented herein decision to carry out operation despite absolute rejection of transfusion of blood or blood components was made only after extensive deliberation. The necessity for more extensive sociological and medico-legal study and definitive assistance in this regard was evident.

The purpose of the presentation is to emphasize features which indicated that the surgical hazards were less than they were thought to be and to interest medical societies in exploring even further the medical and legal ramifications of this fortunately rare but taxing religious encumbrance.

Report of a Case

A 41-year-old woman had been examined by a number of experienced neurosurgeons who recommended operation but refused to operate because of the patient's steadfast rejection of blood transfusion in any circumstances.

Several years previously she had begun to have episodes of nausea and dizziness associated with transient periods of "greying" of vision. Soon thereafter she began to have transient numbness of the left extremities and occasionally of the left facial region. Concomitantly she had feelings of fullness in the head and faintness. In the year before admission to hospital, the incidence of these episodes increased to six to seven times weekly. In addition, she had been having twitching of the left extremities and occasionally of the face for about a year, and often at night she wakened suddenly in fright. During the few months before admission there was an increase in the sensation of fullness of the head associated with generalized headache and discomfort over the right side of the cranium. In the three weeks before she entered the hospital she had become increasingly more lethargic and headache increased.

Inquiry disclosed a tendency to left handedness in the patient, and three of her children showed mixed dominance. She had had a minor head injury without loss of consciousness 14 years previously.

From the Department of Neurosurgery, Orange County General Hospital, Orange.

Submitted 7 July 1966.

Reprint requests to: Department of Neurosurgery, Orange County General Hospital, 101 Manchester Avenue, Orange 92668.

On physical examination, moderate lethargy was noted, with no dysphasia. There were no tremors or twitching. Carotid pulsations were equal without cranial or cervical bruits and there was no papilledema. There was slight left lower facial weakness with definite incoordination of the left foot and slight incoordination of the left hand. This was accompanied by moderate dorsiflexion weakness of the left foot but with preservation of heel walking. Slight weakness of left hand grip was noted. Hypesthesia was present and involved the entire left side but was most pronounced in the foot. Objectively there was no gross error in two point discrimination but the patient said she noted some difficulty on the left side. The left biceps jerk was more active than the right and there was a definite Babinski sign on the left.

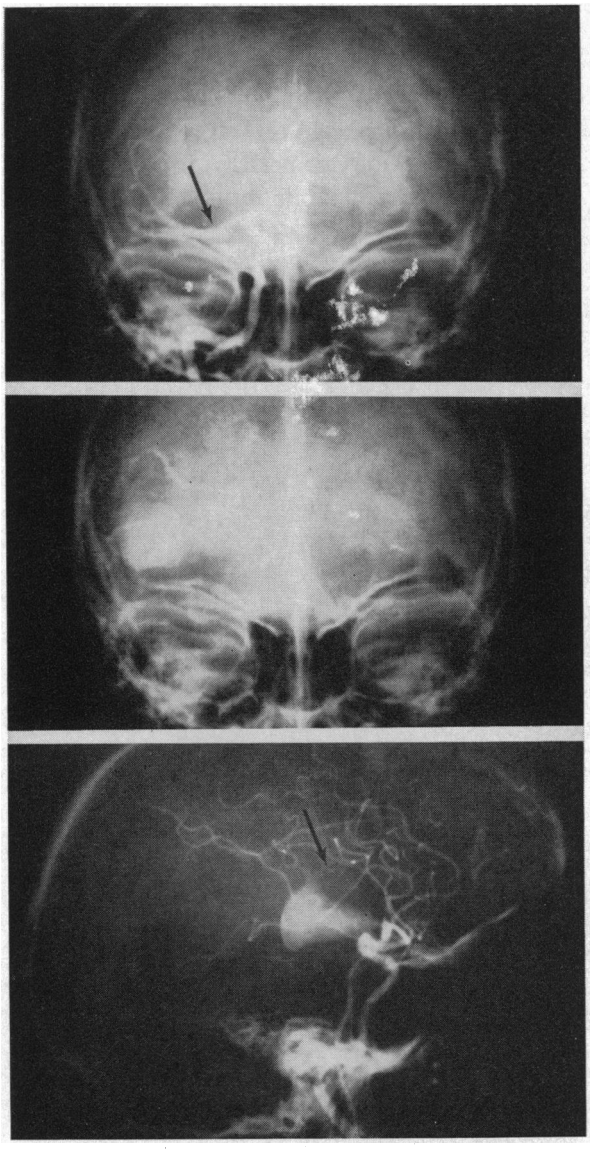

Figure 1.—Arteriogram: *At top,* film in an early arterial phase reveals a sessile trifurcation area aneurysm with bowing of the middle cerebral branches and bloc displacement of the anterior cerebral complex. *Middle,* a late venous phase demonstrates protracted filling of the large aneurysm which acted as a mass lesion. There is displacement of the internal cerebral vein to the left. *Bottom,* there is upward displacement of the middle cerebral artery complex. The pseudopod aneurysmal projection and the discrete linear calcification were considered indicative of intraluminal clotting in an aneurysm more extensive than depicted by the contrast material.

Plain x-ray films of the skull showed linear calcification in the right central sylvian area. An angiographic study demonstrated two aneurysms involving the right middle cerebral artery complex. A sessile aneurysm 0.5 cm in diameter was situated in the trifurcation region and a much larger aneurysm was present distal to the trifurcation in the sylvian area that produced a mass effect with bowing of the middle cerebral branches and upward displacement of the sylvian vascular complex (Figure 1). In addition there was displacement of the anterior cerebral artery complex and of the internal cerebral vein to the left side. The large aneurysm did not fill in the earliest arterial period but showed tardy filling extending well into the venous phase (Figure 2). Exact anatomical delineation of the vessel supplying the area was difficult but the aneurysm was definitely originating from one of the branches distal to the trifurcation. The aneurysm was irregular in outline and did not extend as far as the calcifications mentioned previously. This indicated a larger aneurysm partially filled with clot, while the tardiness in filling was in keeping with origin in a branch rather than a main vessel.

An electroencephalogram was diffusely abnormal and demonstrated a mild degree of slowing with some right hemisphere predominance. There were no discrete focal abnormalities.

Operation was carried out in two stages. The first operation was under local anesthesia and sedation with elevation of a large free temporocentral bone flap. The dura was not opened at this time. The bone was rewired into position and the soft tissues closed. Four days later, after normal convalescence with supportive anticonvulsants, a second operation was done with general anesthesia and again without blood transfusion. The craniotomy was performed with minimum loss of blood. The moderately tense dura was opened and the temporal lobe resected back 6 centimeters. This

produced adequate exposure of the inferior aspect of the large aneurysm. The medially situated feeding vessel, a branch of the middle cerebral, was identified, clipped and divided. Two efferent smaller vessels were identified more posteriorly and were dealt with similarly. The aneurysm was then gently retracted from its compressed bed. This allowed visualization of the more medial aspect of the cerebral branches as well as the trifurcation area where the small sessile aneurysm that had been seen radiographically was observed. It was not disturbed for fear of inducing vascular spasm that might complicate a potential ischemic situation based on the sacrifice of a major sylvian branch. The bed of cerebral tissue at the site of the large aneurysm showed yellowish and brownish discoloration in keeping with probable previous bleeding. After hemostasis, bone and soft-tissue closure was carried out. The dimensions of the dissected and shrunken aneurysm are shown in Figure 2.

The immediate postoperative course was uneventful, with rapid remission of objective physical findings. Several weeks after discharge, however, the patient began to have increasing incidence of episodes of lightheadedness and aberrant behavior associated with hyperactivity. Electroencephalography demonstrated paroxysmal sharp wave and theta activity over the right frontal, central and parietal regions, accompanied by repetitive low to moderate voltage spike discharges in the right posterior temporal and right central areas. The substitution of mysoline medication for dilantin and phenobarbital resulted in resumption of normal behavior and amelioration of the lightheadedness. Postoperative angiograms demonstrated again the trifurcation sessile aneurysm but with complete absence of the original large aneurysm (Figure 3

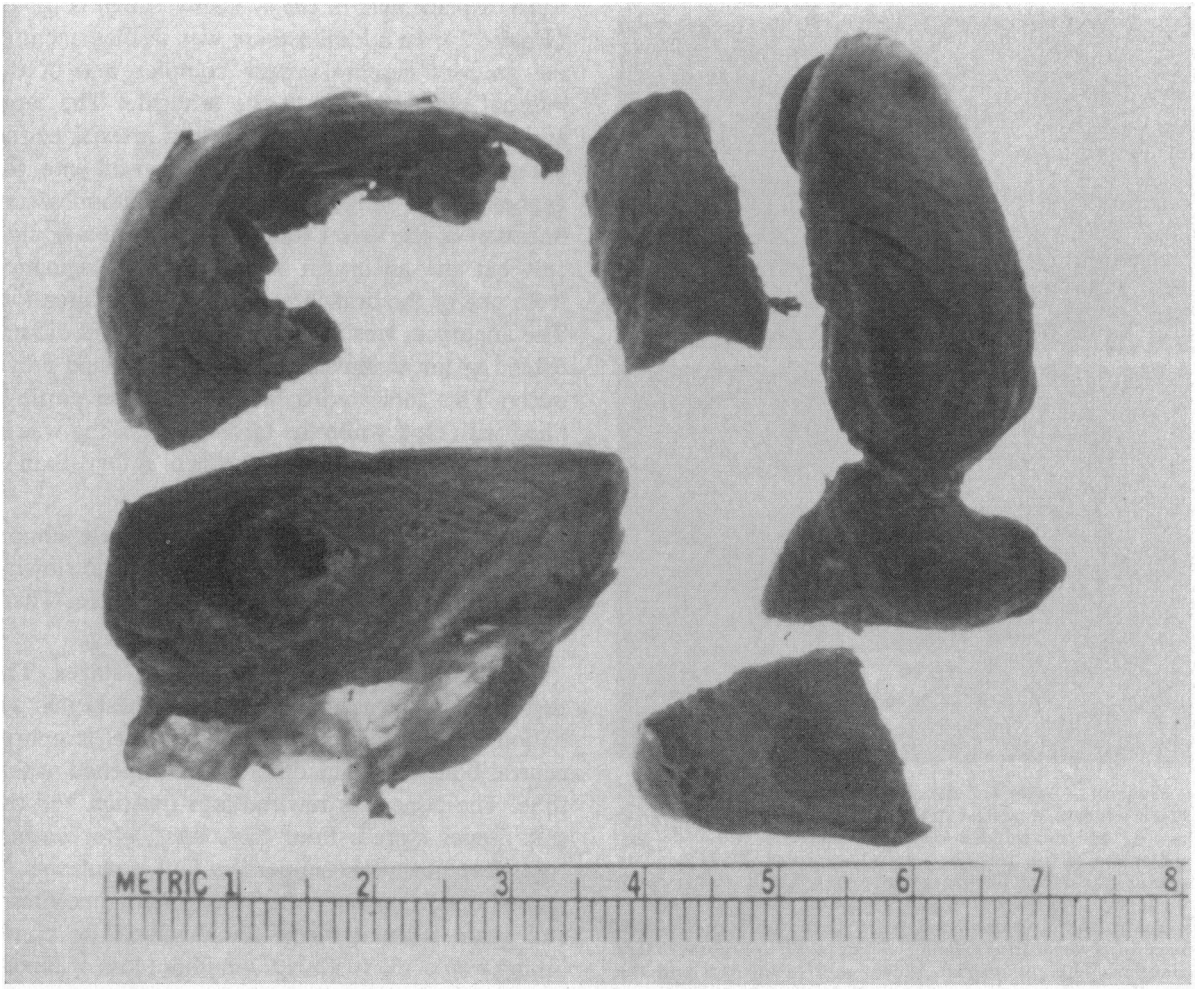

Figure 2.—In spite of the pathological dissection the dimensions of the now shrunken aneurysm are still evident. Partially organized clot occupies a considerable portion of the lumen.

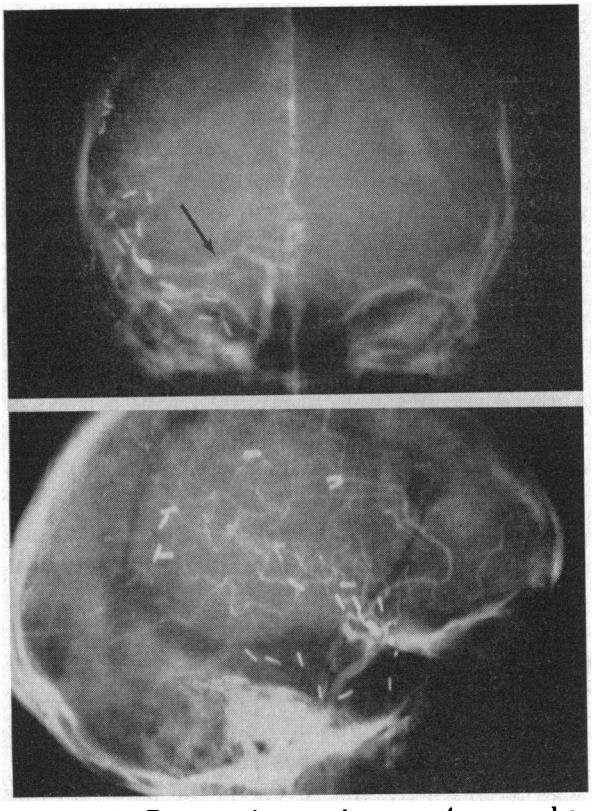

Figure 3.—Postoperative arteriograms. *At top,* a late arterial, early arteriolar phase demonstrates return of the anterior cerebral complex to the midline with absence of the large aneurysm but persistence of the trifurcation sessile dilatation. *Below,* the large aneurysm is no longer present and the middle cerebral artery complex is more normally situated.

a and b). The anterior cerebral complex and internal cerebral vein were back in normal position. Recommendation of another craniotomy for plastic reinforcement of the trifurcation region was rejected.

Discussion

The indication for operation was therapeutic removal of a mass lesion and possible elimination of potential hemorrhage. The two-stage program was carried out in order to preserve blood at the second operation when aneurysmal isolation might have resulted in extensive blood loss. On the other hand, it was considered that the tardy filling of the large aneurysm, along with evidence of intrasaccular clot, was indicative that the lesion was in a minor vessel rather than the middle cerebral artery. As a consequence it was the author's opinion that danger of uncontrollable hemorrhage was unlikely. Although there was mixed dominance it was felt that actual sacrifice of tissue would be at a minimum following the temporal lobectomy. This proved to be the case and there was no postoperative dysphasia or motor dysfunction.

It is the current opinion of most neurosurgeons that transfusion of blood is absolutely essential in operations for intracranial aneurysms. This case demonstrates, however, that each aneurysm should be considered individually. It therefore behooves us not to routinely deny major operation to those who may be in desperate need but cannot morally accept blood transfusion.

Summary

A case of successful excision of an extremely large intracranial aneurysm was carried out without blood transfusion, which the patient forbade on religious grounds. The case reemphasizes the two-stage technique often used by earlier neurosurgeons who lacked the blood bank facilities of today and calls attention to a need for further sociological and medicolegal exploration of the question of religious restriction of indicated therapeutic procedures.

Insidious Splenic Rupture Due To Infectious Mononucleosis Presenting as Acute Glomerulonephritis

MURRAY SHEVICK, M.D., ROBERT ZWEIG, M.D. AND LAWRENCE BRASLOW, M.D., *Arlington*

THE BIZARRE MANIFESTATIONS of infectious mononucleosis present a particular problem in differential diagnosis of acute illness in young persons. The incidence of ruptured spleen has been reported as from 0.5 per cent[5] to 0.1 per cent[14] in treated infectious mononucleosis. The mortality rate associated with this complication is reported between 30 per cent[13] and 55 per cent.[10] While hepatitis,[3] encephalitis,[8] splenomegaly and neuritis[2] are widely

From the Department of Medicine and Surgery, Parkview Memorial Hospital, Arlington.

Submitted 13 May 1966.

Reprint requests to: 3838 Jackson Street, Arlington 92503 (Dr. Shevick).